NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

PASTURE AND HAY PLANTING

(Ac.)

CODE 512

DEFINITION

Establishing native or introduced forage species.

PURPOSES

- This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:
- Establish adapted and compatible species, varieties, or cultivars.
- Improve or maintain livestock nutrition and/or health.
- Balance forage demand during periods of low forage production.
- Reduce soil erosion and improve water quality.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on crop, hay, pasture, and other agricultural lands where forage production is feasible and desired. Pasture and hayland planting is generally not recommended in MRLA 42, unless irrigation is available to insure establishment and production.

CRITERIA

General Criteria Applicable To All Purposes

Plant species and their cultivars shall be selected based upon:

- Climatic conditions, such as annual rainfall, seasonal rainfall patterns, growing season length, humidity levels, temperature extremes and the USDA Plant Hardiness Zones.
- Soil condition and position attributes such as pH, available water holding capacity, aspect, drainage class, fertility level, salinity, depth, flooding and ponding, and levels of toxic elements that may be present.
- Resistance to disease and insects common to the site or location.
- Compatibility with other forage species and their selected cultivar(s).

Specified seeding/plant material rates, methods of planting and date of planting shall be consistent with documented guidance cited by plant materials program, research institutions or agency demonstration trials for achieving satisfactory establishment. See Appendix 1 for seeding/planting rates, dates and adaptation.

The application of a dead litter cover, where needed, will follow the guidance in Appendix 2.

Seeding rates will be calculated as pure live seed (PLS), unless otherwise noted. The germination test used to determine PLS is valid for 9 months after the end of the month the test was made.

Prepared seedbed will be firmed mechanically or by rainfall prior to planting. A quick field method of estimating seedbed firmness is to check the depth of a footprint. If the print sinks into the seedbed much over the depth of a shoe sole, the seedbed is too loose and should be packed (or repacked) prior to seeding. Plant to proper depth, ensuring seed or sprig will contact soil moisture uniformly and provide a medium

that does not restrict or allow roots to become dry

Seedbeds shall be reasonably free of competing vegetation. The following Texas Cooperative Extension (TCE) publications provide additional information on establishment and management of pasture and hayland:

Forage Establishment, Management, and Utilization Fundamentals, by Dr. Larry Redmon; *Planting Winter Annual Legumes,* by Dr. Twain Bulter; *Establishment and Management of Seeded Grasses,* by Dr. Twain Bulter.

Note: the seeding rates in these and other TCE publications may be different than the NRCS seeding rates that appear in **Appendix 1**. **Appendix 1** rates must be used in NRCS planning and application.

All seed and planting materials shall meet state quality standards. Rules and statutes pertaining to seed quality in Texas can be found in Chapters 9, 10, 61, 62, and 64 of the Texas Agricultural Code. A link to these documents is located on the Texas Department of Agriculture web site www.agr.state.tx.us under the Laws and Statutes Section.

Pest will be controlled during the establishment period by use of approved chemical, biological or mechanical methods in accordance with the Pest Management Standard 595.

Select plants that according to state regulations are not considered noxious species.

Fertilizer and soil amendment recommendations for establishment shall be based on results from a current soil test and in accordance with Nutrient Management Standard 590.

Livestock shall be excluded until the plants are well established; unless high stocking rate short duration grazing is implemented for control of competing vegetation.

Appendix 3, *Criteria for Determining Adequacy of Established Perennial Grass Stands*, will be used to determine that a satisfactory stand of perennial grass has been established.

Additional Criteria For Improving Or Maintaining Livestock Nutrition And/Or Health

Establish forage species that are most capable of meeting the desired level of nutrition (quantity and quality) for the kind and class of the livestock to be fed.

Additional Criteria For Balancing Forage Demand During Periods Of Low Forage Production

Select plants that will produce forage for use during periods when other on-farm/ranch forage does not meet livestock needs. Forage species selected shall balance or help balance the dry matter demand of the animals for the desired period of time. Cool-season and/or warm-season annuals can be used to supplement primary perennial forage as part of an ongoing forage program or in years when drought, pest, or other natural or man-made disaster reduces the primary forage production. Refer to **Appendix 1** for seeding rates, dates and adaptation of annual forage plants.

Additional Criteria For Reducing Erosion And Improving Water Quality.

Plants shall provide adequate ground cover, canopy cover, root mass, and vegetative retardance to protect against adverse wind forces and water flows. Current erosion prediction techniques or models will be used to determine if vegetative cover meets the accepted level of erosion control.

CONSIDERATIONS

Prescribed Burning, Prescribed Grazing, Brush Management and Grazing Land Mechanical Treatment may be used in combination with Pasture Planting.

Drilling is the preferred seeding method. Drills used for grass and legume planting should have depth bands, a seed box for small seed, good seed box agitators to prevent bridging, double disc furrow openers and good packer wheels. Broadcasting reduces the chance of successful plantings but is permissible where other methods are not available. Broadcasting is suitable for establishment of perennial grass and/or legume species on cultivated, weed free

seedbed only. Cultipacking or rolling following broadcast seeding is usually necessary to insure good seed contact with the soil.

Broadcast over-seeding or sod seeding of annual grass and/or legume species is suitable on sod that has been grazed or mowed to a height of 2 inches or less.

Forage species planted in mixtures should exhibit similar palatability to avoid spot or selective grazing.

If needed, legume seed should be inoculated with the proper, viable rhizobia before planting. Refer to, *Inoculation, Nodulation, Nitrogen Fixation and Transfer,* by Dr. Twain Bulter and Dr. Gerald Evers for additional guidance.

Fertilizer needs to be appropriately placed and timed to be effective. When phosphorus and/or potassium rates are very low to moderate the recommended amounts of these nutrients should be incorporated as part of final seedbed preparation. When competing vegetation is expected to be a problem all or part of the nitrogen fertilizer should be applied after germination of seeded species or after sprigs begin to grow.

When limestone is required to improve soil pH for establishment of perennial grass or legume, it should be applied in the fall prior to spring planting, and incorporated during seedbed preparation, when feasible. When limestone application is needed to improve soil pH for planting of over-seeded legumes, the limestone should be applied at least 6 months prior to over-seeding.

Coated seed should be seeded at the same rate as non-coated seed but the planting equipment needs to be re-calibrated.

In areas frequented by high density of animals, establish persistent species that can tolerate close grazing.

Where wildlife management is an objective, use an approved habitat evaluation procedure to aid in selecting plant species and providing for other habitat requirements.

PLANS AND SPECIFICATIONS

Specifications for the establishment of pasture and hay planting shall be prepared for each site or management unit according to the Criteria and Considerations described in this standard, and shall be recorded on specification sheets, job sheets, in narrative statements in the conservation plan, or other acceptable documentation. When specification sheets and or species specific job sheets are used, they will be referenced in the conservation plan narrative.

OPERATION AND MAINTENANCE

The operator will inspect and calibrate equipment prior to use to insure proper rate, distribution and depth of planting material (planting too deep is a common mistake).

Growth of seedlings or sprigs shall be monitored for water stress. Depending on the severity of drought, water stress may require reducing weeds, early harvest of any companion crops, irrigating when possible, or replanting failed stands.

Invasion by undesirable plants shall be controlled by cutting, using a selective herbicide, or by grazing management by manipulating livestock stocking rates, density, and duration of stay.

Insects and diseases shall be controlled when an infestation threatens stand survival.

Evaluate forage stands each season or as needed to determine management inputs needed to achieve the desired purpose(s).

APPROVAL AND CERTIFICATION

PASTURE & HAYLAND PLANTING

(Acre)

CODE 512

PRACTICE STANDARD APPROVED:

/s/ Monty Dollar	7/25/02
State Agronomist	**Date**

This practice standard is needed in the _____ Field Office Technical Guide.

District Conservationist	**Date**

CERTIFICATION:

Reviewed and determined adequate without need of revision.

Technical Specialist (Agronomy)	**Date**
Technical Specialist (Agronomy)	**Date**

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Appendix 3

Criteria for Determining Adequacy of Establishment for Perennial Grass Stands

Source: TX NRCS & TCE

GRASS	Live Plants Uniformly Distributed - Average Number per Sq. Foot		
	Category 1 [1/]	Category 2	Category 3
Bermudagrass - seeded or broadcast sprigged	0 - 0.1	0.1 - 0.3	Over 0.3
Bermudagrass - sprigged in 40" rows	< 5 live plants per 100 feet of row	5 - 10 live plants per 100 feet of row	> 10 live plants per 100 feet of row
Kleingrass, Weeping Lovegrass, Tall Fescue	0 - 0.3	0.3 - 0.5	> 1.0
Other Seeded Grasses	0 - 0.2	0.2 - 0.5	> 0.5

[1/] **Category 1** - Stand is unsatisfactory and practice should be reapplied.
Category 2 - Stand is marginal - NRCS and the producer will decide whether to reapply or not. Factors to consider are vigor of existing plants, extent of competition, and the desire of the producer.
Category 3 - Stand is satisfactory.

Timing of Stand Determinations

DRYLAND -

1. For all native grasses, introduced bluestem, and bahiagrass make the determination at the end of the second growing season, unless the grass emerged and died (frost or drought) the first growing season. In that case the determination should be made the first year.

2. For bermudagrasses , make the determination at the end of the first growing season, unless the grass emerged died earlier in the year. In that case the determination can be made earlier in the first year.

IRRIGATED LAND -

All irrigated grasses - Determination may be made 90 days after planting, provided conditions have been suitable for emergence and growth.

Method of Making Determinations -

1. For seeded species and broadcast bermudagrass sprigs or tops, a step count method will provide an adequate means of estimating average number of plants per square foot.

- Choose a representative area(s) of the field.
- Predetermine a line across the area and estimate the distance of travel.
- Divide the distance by 50 to determine spacing between sample sites.
- Pace the line, stopping at each of the 50 sample sites, and estimate the number of live plants in a square foot at the end of your left foot.
- Total the number of live plants from all 50 sample sites and divide by 50 to get the number of live plants per square foot.
- You may use less than 50 sample sites as long as your sample group adequately inventories the area planted.

2. For bermudagrass planted with a sprigger in 40" rows, pick several areas in the field and count the number of live plants per 100 feet of row.

3. For native or mixed species where seedbed is not prepared, clip and weigh vegetation along a predetermined route across a representative area of the field to determine percent composition of the seeded grasses plus preferred and desirables (for intended use).

Other Establishment Information -

Approximate Number of Sprigs Planted per 100 Feet of 40" Row

Source: TCE

Sprigging Rate per Acre	Sprigs per 100 feet of 40" row
5 bu	38
12 bu	86
24 bu	172